

Application No. 10/731,409
Filed: December 9, 2003
TC Art Unit: 3677
Confirmation No.: 3924

IN THE CLAIMS

Please amend claim 1; cancel claim 2 without prejudice; and add new claims 3-5 as shown in the Status of the Claims section, infra. Additions are underlined and deletions are. No new matter has been added.

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STATUS OF THE CLAIMS

Claim 1 (currently amended) An injection device for injecting resin by advancing an injection screw driving body, wherein—whereby rotational movement of an electric motor a rotating movement of a screw shaft is converted to linear movement of the injection screw driving body to advance for driving an the injection screw driving body, cause by an electric motor is converted into a linear movement of an injection screw driving body by screwing the screw shaft and a nut member positioned at the injection screw driving body with each other and resin is injected according to an advancing movement of the injection screw driving body and the injection device comprising:

an injection screw operatively-coupled to said injection screw driving body;

coupling between the a ball screw shaft, having a shaft end portion and a ball screw shaft spline that is disposed on an outer periphery of said shaft end portion, operatively-coupled to said injection screw driving body via a nut member;

and the motor shaft of the an electric motor having a motor shaft; is performed by engagement of a screw shaft spline and a motor shaft spline with each other, and comprising

a bearing sleeve for coupling said ball screw shaft to said motor shaft, the bearing sleeve having:

an inner diameter for engaging said shaft end portion one end of the ball screw shaft,

a flange integrally formed on an outer periphery of the bearing sleeve for releasably attaching said bearing sleeve to an end face of said motor shaft,

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a rear portion disposed at the rear of the flange that is adapted to ~~formed into a size-fitted fit~~ into a recess provided in the ~~formed inside of an end face of said~~ the motor shaft, and

an inner spline disposed at an inner periphery of the bearing sleeve, and

an annular groove provided at the inner periphery near an opening for said shaft end portion of the ball screw shaft; and

a ring member that is disposable in said annular groove, for air-tightly sealing a clearance formed between the ball screw shaft and the bearing sleeve,

wherein the bearing sleeve is detachably mounted to said end face of the motor shaft by fitting the rear portion of said bearing sleeve into the recess and fastening the flange to said an end face of the motor shaft ~~with a bolt~~ such that said bearing sleeve the inner-spline serves as a the motor shaft spline for the motor shaft, and

~~the screw shaft spline is formed on an outer periphery on a shaft end portion of the screw shaft.~~

Claim 2 (canceled).

Claim 3 (new). The injection device as recited in claim 1, wherein the bearing sleeve spline and the ball screw shaft spline are involute.

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Claim 4 (new). The injection device as recited in claim 1, wherein the ring member is selected from the group comprising a seal ring or an O-ring.

Claim 5 (new). The injection device as recited in claim 1, wherein said bearing sleeve spline and said ball screw shaft spline are adapted to engage each other so that rotation of said motor shaft becomes rotation of said ball screw shaft.